

HYDRON COLOURS ON COTTON PIECE-GOODS



CASSELLA COLOR COMPANY

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HYDRON COLOURS
ON
COTTON PIECE-GOODS



CASSELLA COLOR COMPANY

182 AND 184 FRONT STREET

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HYDRON COLOURS ON COTTON PIECE-GOODS.

The Hydron Colours are vat dyestuffs of excellent properties of fastness and of very good levelling properties.

They are dyed with hydrosulphite, some of them also with sodium sulphide and hydrosulphite, and the addition of caustic soda lye. The latter may in individual cases be substituted by carbonate of soda.

For the dyeing, apparatus of wood or iron are used; when dyeing with the addition of sodium sulphide any fittings of copper or brass have to be avoided.

The following brands of Hydron Colours are in the market:

- Hydron Blue G Paste 20% and 40% pat.
- „ G Powder pat.
- „ B Paste 20% and 40% pat.
- „ B Powder pat.
- „ R Paste 20% and 40% pat.
- „ R Powder pat.
- Hydron Dark Blue G Paste 20% and 40% pat.
- „ G Powder pat.
- Hydron Violet B Paste 20% and 40% pat.
- „ B Powder pat.
- „ R Paste 20% and 40% pat.
- „ R Powder pat.
- Hydron Olive G Paste 40% pat.
- „ G Powder pat.
- „ B Paste 40% pat.
- „ B Powder pat.
- Hydron Brown OG Powder pat.
- „ OB Powder pat.
- Hydron Yellow G Paste 20% pat.

DISSOLVING THE HYDRON COLOURS.

Paste Products: The Hydron Blue and Hydron Violet paste products may be added straightaway to the dyebath. Mix the paste with warm water, and add this mixture together with the requisite quantities of alkali to the warm bath; then add the quantities of sodium sulphide and hydrosulphite indicated for the respective recipes whilst agitating. After the addition of the hydrosulphite the dyestuff is quickly vatted (reduced).

Hydron Dark Blue G Paste is dissolved in the same manner.

Hydron Yellow Paste and Hydron Olive Paste are diluted in about 5 to 10 times their weight of water free from lime, and are then reduced and dissolved by the addition of the quantities of hydrosulphite and lye necessary for dyeing, at a temperature for Hydron Yellow of 30° C. (85° F.) or at the outside 40° C. (105° F.), and for Hydron Olive of 60—70° C. (140—160° F.).

Powder Products: The dyestuff is mixed to an even paste with about one-half or its own weight of cold to lukewarm water free from lime. Furthermore, about ½ gallon methylated spirits is added per gallon water in order to ensure a more rapid formation of a more even paste. This paste is diluted with about ten times its weight of cold water, and may then be added straightaway to the dyebath.

DIRECTIONS FOR DYEING.

Hydron Blue.

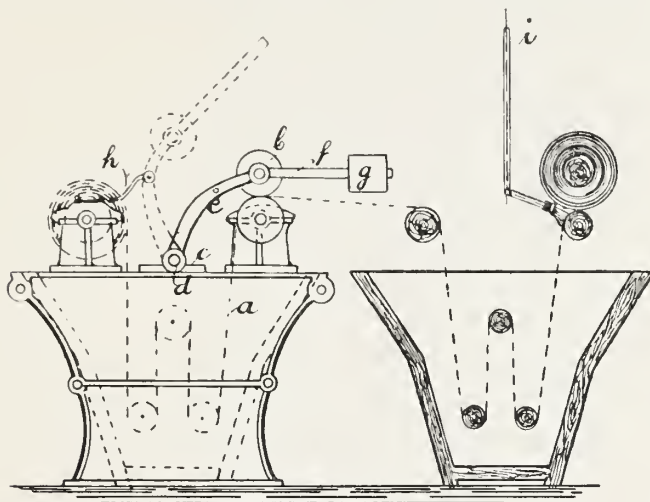
Hydron Blue may be dyed on piece-goods by the following methods:

1. In the jigger provided with squeezing rollers,
2. in the continuous dyeing machine,
- 3a. in the padding machine by dyeing in the large trough,
- 3b. in the padding machine by padding.

For the dyeing of piece-goods, the method with sodium sulphide and hydrosulphite has been found particularly well adapted, a good penetration of the goods being obtained at a comparatively low price.

1. Dyeing in the Jigger.

This is the most extensively employed method of dyeing. Any ordinary jigger provided with squeezing rollers may be used for the purpose; and it is an advantage to combine a rinsing jigger with the dye-jigger. The requisite squeezing rollers may be fitted to any ordinary jigger available, according to the following sketch.



The narrow ends (*a*) of the jigger are fitted with two bearings (*c*) which carry the shaft (*d*). To each end of the shaft, right and left, a lever (*e*) is affixed immoveably by means of a rabbet and wedge carrying the squeezing roller (*b*). The levers extend beyond the roller-bearings through the arms (*f*), which may be weighted with the weights (*g*). When not in actual use, the whole arrangement is thrown back into the position shown by the dotted lines, and is there arrested by means of a bolt which passes through an eye in arm (*h*). By means of the sprinkler (*i*) the goods are sprinkled sideways on leaving the rinsing jigger.

During the dyeing, the squeezing roller rests over the jigger, the dyeing being carried out as customary; only during the last passage the squeezing roller is lowered and put into action, the goods passing between the rollers, straight into the rinsing bath, without being batched.

Jiggers with squeezing rollers are constructed by most textile machine builders; a great many of them are already in use, especially for the dyeing of Hydron Blue.

DIRECTION FOR DYEING.

	Starting Bath:	Addition for Subsequent Lots:
Hydron Blue Paste 20%	3 —30%	2½—20%
Sodium sulphide crystals	3 —30%	2½—15%
Caustic soda lye 77° Tw.	3 —15%	2½— 8%
Hydrosulphite conc. Powder	1½— 6%	1¼— 4%

Charge the dyebath with the requisite quantities of dyestuff, sodium sulphide and caustic soda lye, run the goods boiling hot for about $\frac{3}{4}$ hour, cool off with cold water to about 60—70° C. (140—160° F.), and gradually scatter in the hydrosulphite in small portions. When the bath has assumed an entirely yellow appearance, run the goods for another $\frac{1}{2}$ hour or so at 60—70° C. (140—160° F.), squeeze off well, and conduct to the rinsing bath. The rinsing is carried out as indicated on page 5.

Example for Dyeing a Light Blue Shade.

100 lbs goods	Starting Bath:	50—60 gallons liquor. Additions for Subsequent Lots:
Hydron Blue G Paste 20%	5 lbs	3 $\frac{1}{2}$ lbs
Sodium sulphide crystals	5 „	3 $\frac{1}{2}$ „
Caustic soda lye 77° Tw.	5 „	3 $\frac{1}{2}$ „
Turkey-red oil or the like	1 $\frac{1}{2}$ „	$\frac{5}{8}$ lb

Example for Dyeing a Medium Blue Shade.

100 lbs goods	Starting Bath:	60 gallons liquor. Additions for Subsequent Lots:
Hydron Blue B Paste 20%	15 lbs	10 lbs
Sodium sulphide crystals	15 „	8 „
Caustic soda lye 77° Tw.	7 $\frac{1}{2}$ „	4 „
Turkey-red oil or the like	1 $\frac{1}{4}$ lb	$\frac{1}{2}$ lb

Example for Dyeing a Dark Blue Shade.

100 lbs goods	Starting Bath:	60 gallons liquor. Additions for Subsequent Lots:
Hydron Blue R Paste 20%	16 lbs	11 lbs
Hydron Blue G Paste 20%	4 „	3 „
Sodium sulphide crystals	20 „	9 „
Caustic soda lye 77° Tw.	10 „	5 „
Turkey-red oil or the like	1 $\frac{1}{4}$ lb	$\frac{1}{2}$ lb

Add one-half of the ingredients on commencing to dye and the other half after the first passage. After preparing the goods for the dyeing and beaming them well, give 4 to 6 passages near boiling temperature. Hereafter cool the bath with cold water down to about 70° C. (160° F.), and scatter in the hydrosulphite until the dyebath has a completely yellow appearance, about one-quarter to one-fifth the weight of hydrosulphite as of dyestuff being required for medium and deep blues and about one-third for light blues, reckoned on the weight of Hydron Blue paste 20%.

After another 4 to 6 passages at about 70° C. (160° F.), squeeze the goods off, and conduct them straight into the rinsing bath adjoining.

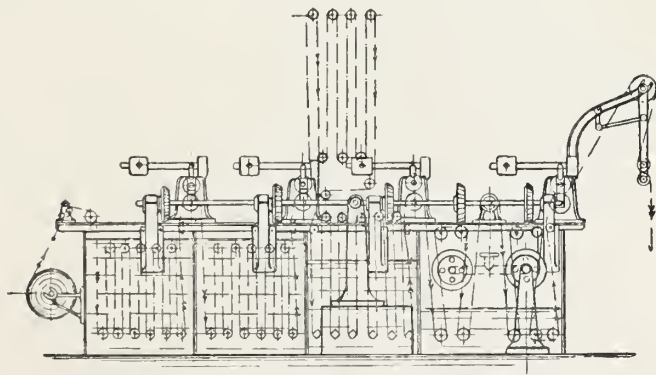
If the dyebath and goods gradually assume a greenish appearance after adding the hydrosulphite, a little more hydrosulphite should be added. It is especially advisable to add a little hydrosulphite before the last passage, i. e. a short time before squeezing off the goods.

The rinsing in the rinsing jigger is effected by first giving the goods a few passages in a cold bath and then two or three in a hot bath. The test of the goods being sufficiently rinsed is that after the rinsing they must no longer be alkaline or must contain but a trace of alkali. If the requirements for fastness are very exacting, the goods may be thereupon soaped, or in the case of light shades treated with perborate.

The dyeing of further lots is commenced with sodium sulphide and caustic soda lye alone, one-half to two-thirds of the quantities previously used being sufficient, varying with the shade to be dyed; in the same way as in the first bath, 4 to 6 passages are given, hydrosulphite being thereupon again added.

2. Dyeing in the Continuous Dyeing Machine.

The continuous dyeing machine of the construction shown in the sketch below is much to be recommended.



The first two vats contain the dye liquor, the third and fourth serving for the rinsing. Before the rinsing, the goods may be taken for oxidation over the guiding rollers arranged above the dyeing and rinsing vats.

This oxidation is at all times to be recommended for light shades, while for deep shades rinsing directly after the dyeing is to be given the preference if the goods are expected to be specially fast to rubbing.

The boxes may be made of either wood or iron, but the small inside guiding rollers should always be of iron. The squeezing rollers may be made of iron, coated if necessary with rubber, and should be covered with cloth as usual. A closed iron steam-pipe is employed for heating the bath.

The bath is charged for example as follows for producing a medium blue:

1	lb	Hydron Blue R Paste 20%	} per 10 gallons liquor.
$\frac{1}{2}$	„	Hydron Blue G Paste 20%	
$1\frac{1}{2}$	„	Sodium sulphide crystals	
12	oz	Caustic soda lye 77° Tw.	
5	„	Hydrosulphite conc. Powder	
3	„	Turkey-red oil or the like	

During the dyeing the dye-bath is replenished with

8 %	Hydron Blue R Paste 20%
4 %	Hydron Blue G Paste 20%
8 %	Sodium sulphide crystals
4 %	Caustic soda lye 77° Tw.
3 %	Hydrosulphite conc. Powder.

The replenishing liquor is prepared in a wooden or iron vessel by agitating the requisite quantities of dyestuff and dissolving agents in about five times their weight of water at 50° C. (120° F.), the solution being then added to the dye vat.

The goods after being previously wetted out well and squeezed off are given 1—2 passages at 60—70° (140—160° F.), squeezed off, passed over some guiding rollers if necessary for oxidation, and rinsed.

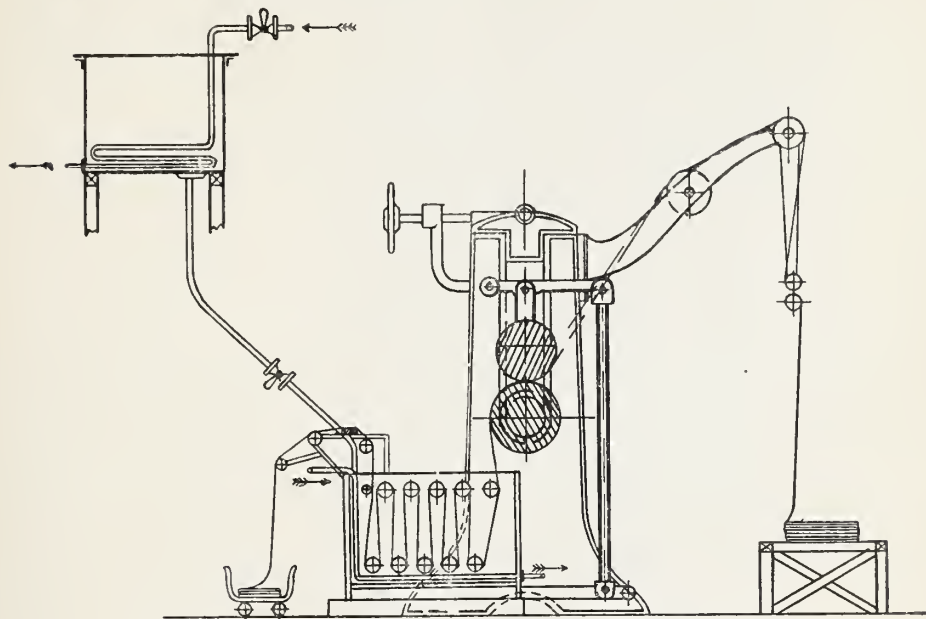
3a) Dyeing in the Padding Machine with a Large Trough.

The system of dyeing in the padding machine is applied principally for light-class fabrics in medium depths of shade.

Hydron Blue has been found to be very well adapted for this method of dyeing, and plain blues may be produced by this method in the simplest possible manner possessing a degree of fastness such as could not be obtained hitherto. Apart from its suitability for plain blue goods, the method may also be followed for dyeing resist styles.

The sketch opposite indicates a padding machine of the kind suited for the dyeing of Hydron Blue.

As will be seen, an ordinary jigger is used with a trough of a capacity of about 160 gallons. The trough should be so arranged that it may be heated by indirect steam, the feeding liquor being contained in a vessel standing on a somewhat higher level, from which it flows in continuously.



The dry goods are passed through the colour trough at a temperature of $60-70^{\circ}\text{C}$. ($140-160^{\circ}\text{F}$). The passage should be so regulated that the goods remain for $\frac{1}{2}$ to $1\frac{1}{2}$ minutes in the bath, according to the depth of shade required; if necessary the size of the roller vat has to be adapted to the duration of the passage.

During the passage of the goods the strength of the dye-liquor is maintained by feeding the bath with a stronger dye solution according to requirement. For this purpose the feeding liquor at a temperature of $40-50^{\circ}\text{C}$. ($105-120^{\circ}\text{F}$.) is made to flow in such a manner into the roller vat that the liquor is always kept at the same level.

After squeezing off evenly, the goods are washed thoroughly from cold to hot, soaped hot if necessary, or aftertreated with perborate in order to obtain bright shades.

Very full shades are best dyed in two passages, soda being employed instead of caustic soda lye. The goods are then worked in such a manner as to have the last piece of the first passage run as the first piece of the second passage, the requisite feeding liquor being divided over the two passages. The pressure of the squeezing rollers of the padding machine should be so regulated that the fabric absorbs 90—100% of its weight in dye-liquor.

Care has to be taken that the starting baths are never charged with more than 5 lbs Hydron Blue R Paste 20%, 3½ lbs Hydron Blue B Paste 20% or 2½ lbs Hydron Blue G Paste 20% per 10 gallons liquor; the feeding liquor on the other hand may be kept considerably stronger. This concentrated bath for freshening up the liquor should be stirred vigorously from time to time.

Care should also be taken that the dyebaths and the goods passing through them always have an entirely yellow appearance; as soon as the baths or the goods begin to assume a green colour, a little hydrosulphite, and if necessary also a little alkali, have to be added.

Example:

The trough with a capacity of about 160 gallons is charged as follows:

Light Blue:

1 lb	Hydron Blue G Paste 20%	} per 10 gallons liquor.
½	„ Sodium sulphide crystals	
½	„ Caustic soda lye 77° Tw. or soda ash	
¼	„ Hydrosulphite conc. Powder	
3 oz	Turkey-red oil or the like	

Feeding liquor:

2 lbs	Hydron Blue G Paste 20%	} per 10 gallons liquor.
12 oz	Sodium sulphide crystals	
12	„ Caustic soda lye 77° Tw. or soda ash	
8	„ Hydrosulphite conc. Powder	
3	„ Turkey-red oil or the like	

Medium Blue:

1½ lbs	Hydron Blue R Paste 20%	} per 10 gallons liquor.
1	„ Hydron Blue G Paste 20%	
1½	„ Sodium sulphide crystals	
1	„ Caustic soda lye 77° Tw. or soda ash	
½	„ Hydrosulphite conc. Powder	
3 oz	Turkey-red oil or the like	

Feeding liquor:

4 lbs	Hydron Blue R Paste 20%	} per 10 gallons liquor.
2½	„ Hydron Blue G Paste 20%	
2	„ Sodium sulphide crystals	
1½	„ Caustic soda lye 77° Tw. or soda ash	
1½	„ Hydrosulphite conc. Powder	
3 oz	Turkey-red oil or the like	

Dark Blue:

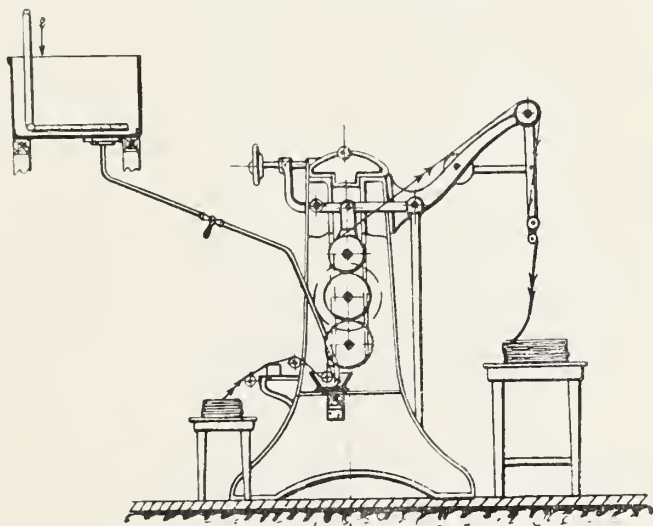
5	lbs	Hydron Blue R Paste 20%	} per 10 gallons liquor.
2	,,	Sodium sulphide crystals	
1 $\frac{1}{2}$,,	Caustic soda lye 77° Tw. or soda ash	
$\frac{1}{5}$,,	Hydrosulphite conc. Powder	
3	oz	Turkey-red oil or the like	

Feeding liquor:

12	lbs	Hydron Blue R Paste 20%	} per 10 gallons liquor.
2 $\frac{1}{2}$,,	Sodium sulphide crystals	
2	,,	Caustic soda lye 77° Tw. or soda ash	
2	,,	Hydrosulphite conc. Powder	
3	oz	Turkey-red oil or the like	

3b) Padding in the Padding Machine.

A padding machine provided with a very small trough is used. In a vessel placed on a higher level than the padding machine the liquor is prepared according to the shade required, and heated by indirect steam. During the dyeing this liquor flows continuously into the trough, for preference so as to become evenly distributed under the surface of the liquor; see following sketch.



The dry goods freed thoroughly from size are passed through the dye-trough, squeezed off, and batched or rinsed straightaway.

As a rule, the goods may be padded at 60—70°C. (140—160° F.) with sodium sulphide, hydrosulphite and caustic soda lye. If the padding machine has copper or brass fittings, the goods are dyed without sodium sulphide, caustic soda lye being to advantage substituted by soda.

a) Padding with Sodium Sulphide and Hydrosulphite.

1— 3 lbs Hydron Blue Paste 20%	}	per 10 gallons liquor.
10—16 oz Caustic soda lye 77° Tw. or soda ash		
1— 2 lbs Sodium sulphide crystals		
5—10 oz Hydrosulphite conc. Powder		
3— 5 „ Turkey-red oil or the like		

b) Padding with Hydrosulphite.

1— 3 lbs Hydron Blue Paste 20%	}	per 10 gallons liquor.
1— 3 „ Caustic soda lye 77° Tw. or soda ash		
½— 1 „ Hydrosulphite conc. Powder		
3— 5 oz Turkey-red oil or the like		

The padding process comes into consideration for light shades only.

AFTERTREATING HYDRON BLUE.

Hydron Blue shades do not as a rule require any special after-treatment, provided the goods are finally well rinsed hot, or soaped hot.

In some instances the following methods of aftertreatment may be applied:

Treatment with Perborate.

The treatment results in considerably brighter shades being obtained, which like those which are not aftertreated, possess excellent fastness.

The goods are aftertreated for 20 to 30 minutes with ½—1½ % perborate in a bath heated to 60—80° C. (140—175° F.), whereupon they are rinsed again.

An aftertreatment with a small quantity (about ¼ %) of perborate in a bath heated to only 30—40° C. (85—105° F.) is in many instances resorted to in order to accelerate oxidation.

Treatment with Copper Sulphate and Bichrome.

The already excellent fastness to boiling and light of the dyeings is still further improved by an aftertreatment with 3% copper sulphate, 1% bichrome and 3—5% acetic acid. This aftertreatment may be carried out in a warm or in a cold bath for 5 to 15 minutes, which time proves sufficient. Finally the goods are rinsed thoroughly.

HYDRON BLUE ON AN IRON MORDANT.

Whereas the methods described in the foregoing allow of the production of a large variety of light and dark blue shades by dyeing direct, a very deep coppery blue shade is demanded in certain instances which cannot be produced by dyeing direct without using excessive quantities of dyestuff. However, by mordanting with iron salts and dyeing subsequently with Hydron Blue, very fine, full coppery blue shades may be produced fully equalling deep Indigo shades, but far excelling them in properties of fastness.

The method of working is as follows:

The boiled goods are treated for about 30 minutes in a cold bath charged with 1—1½ lbs copperas per 10 gallons or with a solution of pyrolignite of iron or nitrate of iron of 2—4° Tw., some acetic or formic acid being to advantage added. They are then squeezed off, entered into a lukewarm bath charged with 1—1½ lbs soda ash per 10 gallons and treated therein for about 15 minutes. After rinsing thoroughly, they are then dyed with Hydron Blue, to best advantage with about the same quantity of caustic soda lye or soda and one-half the quantity of hydrosulphite as of dyestuff (20% paste) used.

SADDENING OF HYDRON BLUE SHADES.

For saddening Hydron Blue in order to obtain more covered shades, Hydron Dark Blue G mentioned on page 11 is the product best suited.

Immedial Colours may however likewise be used for this purpose, in particular Immedial Black V extra, Immedial Brilliant Black 5BV conc., Immedial Brilliant Carbon F and Indo Carbon S; these are dissolved in the customary manner with sodium sulphide and may be added straight to the Hydron Blue bath. In such case the caustic soda lye is to advantage replaced by soda.

Hydron Dark Blue G Paste 20 % and 40 %

Hydron Dark Blue G Powder.

This product is best dyed with sodium sulphide, hydrosulphite and caustic soda lye, in the same manner as stated for Hydron Blue; the quantity of caustic soda lye should however be increased in the starting baths to about the same weight as of dyestuff in 20% paste form. When dyeing further lots in the standing bath, one-half to three-fourths the quantity of lye as of dyestuff, in 20% paste form, are sufficient.

The directions for dyeing are otherwise the same as stated for Hydron Blue. Hydron Dark Blue G is not to be aftertreated in any special manner.

Hydron Violet B and R Paste 20⁰/₀ and 40⁰/₀

Hydron Violet B and R Powder

are dyed in the same kinds of apparatus as Hydron Blue, best however with hydrosulphite and caustic soda lye only; goods difficult to penetrate may also be dyed in the manner customary for Hydron Blue according to the sodium sulphide process, but in such case a little more hydrosulphite should be used than is stated for Hydron Blue.

When dyeing with hydrosulphite and caustic soda lye, charge the dyebath with

	Starting Bath:	Additions for Subsequent Lots:
Dyestuff in 20% paste form	5—30%	4—18%
Hydrosulphite conc. Powder	5—15%	4— 9%
Caustic soda lye 77° Tw.	5—15%	4— 6%

Heat the bath to about 50° C. (120° F.), and add first the caustic soda lye, then the dyestuff well mixed with hot water; hereafter gradually strew in the hydrosulphite, and mix well. Dye with 8 to 10 passages, at about 50° C. (120° F.), squeeze off, and soap.

The reduced baths of Hydron Violet must show a yellow appearance; if this is not the case, some more hydrosulphite, and if necessary also some caustic soda lye, must further be added.

In order to produce as bright shades as possible, Hydron Violet is either soaped boiling hot after dyeing (with about 8 oz soap per 10 gallons liquor) or aftertreated with perborate.

Example for Producing a Medium Violet Shade.

100 lbs goods	60 gallons liquor	
	Starting Bath:	Additions for Subsequent Lots:
Hydron Violet Paste 20%	10 lbs	7 lbs
Hydrosulphite conc. Powder	7 ½ „	5 „
Caustic soda lye 77° Tw.	5 „	3 ½ „
Turkey-red oil or the like	1 lb	0.2 „

First add the caustic soda lye and oil at a temperature of about 50° C. (120° F.), pass the goods twice hot through the bath, add the requisite dyestuff through a sieve, gradually strew the hydrosulphite conc. powder into the bath in small portions, and stir thoroughly.

Add the dyestuff and hydrosulphite divided over two passages to the dyebath, and give the goods prepared for dyeing 8 to 10 passages at about 50° C. (120° F.); then squeeze off, and rinse straightaway cold to hot in a jigger placed alongside for this purpose.

After thorough rinsing, the goods are either soaped boiling hot or developed with perborate, and then rinsed once more.

The dyebath must have an entirely yellow appearance. If the goods and the bath begin to assume a greenish colour during the dyeing, some more hydrosulphite must be added; this is particularly advisable before the last passage.

Hydron Yellow G Paste 20 %

is to best advantage dyed with hydrosulphite and caustic soda lye according to the following directions in a jigger provided with squeezing rollers and an arrangement for oxidising; light to medium shades may be padded in the padding machine.

	Starting Bath:	Additions for Subsequent Lots:
Hydron Yellow G Paste 20%	4—30%	2—20%
Hydrosulphite conc. Powder	4—10%	2— 8%
Caustic soda lye 77° Tw.	4—24%	2—10%
Common salt or desiccated Glauber's salt	½— 3 lbs	0— 8 oz per 10 gallons liquor.

Dye in a cold to lukewarm bath with 6 to 8 passages, squeeze off, oxidise, rinse, and soap if necessary.

Dyeing in the Jigger.

Charge the dyebath with caustic soda lye and common salt or Glauber's salt and the requisite quantity of dyestuff and hydrosulphite. It is besides advisable to add 1½—3 oz Turkey-red oil or monosolvol per 10 gallons liquor.

Example for Dyeing a Medium Yellow Shade in the Jigger.

100 lbs of goods		60 gallons liquor	
	Starting Bath:		Additions for Subsequent Lots:
Hydron Yellow G Paste 20%	20 lbs		13 lbs
Hydrosulphite conc. Powder	7 „		4 ½ „
Caustic soda lye 77° Tw.	15 „		7 „
Common salt or desiccated Glauber's salt	12 „		3 „
Turkey-red oil, or the like	1 ¼ „		½ „

The goods, after being prepared for the dyeing and well freed from size, are given 6 to 8 passages in a cold to lukewarm bath. One-half of the ingredients is added on commencing to dye, the other half after the first passage. The dyebath and the goods must have an entirely brown appearance during the whole of the dyeing process. Should the lists begin to assume a yellow colour, some hydrosulphite must be added. After dyeing, the goods are pressed off evenly, passed over some guding rollers in order to oxidise, rinsed, starting cold and finishing off hot, and soaped hot if necessary.

• **Padding in the Padding Machine.**

The dry goods, freed well from size, pass at about 30° C. (85° F.) the customary small padding trough, which, varying with the shade to be produced, is charged with

1	—4	lbs Hydron Yellow G Paste 20%	} per 10 gallons liquor.
$\frac{1}{2}$	— $1\frac{1}{3}$	„ Hydrosulphite conc. Powder	
1	— $2\frac{1}{2}$	„ Caustic soda lye 77° Tw.	
$\frac{1}{2}$	—3	„ Desiccated Glauber's salt and	
$1\frac{1}{2}$	—3	oz Turkey-red oil or the like	

The dye liquor is prepared in accordance with the shade desired in a vessel placed in a an elevated position over the padding machine, and during the dyeing operation flows continuously into the padding trough. The method of working subsequent to the dyeing is exactly the same as stated for dyeing in the jigger.

Aftertreatment of Hydron Yellow.

By aftertreating the dyeings with hypochlorite of soda, a somewhat more reddish and brighter shade may be produced. The goods are treated for about $\frac{1}{2}$ hour in a solution of hypochlorite of soda of about $\frac{3}{4}$ ° Tw., and then rinsed well.

Hydron Olive G and B Paste 40°/o

Hydron Olive G and B Powder

Hydron Brown OG and OB.

Hydron Olive and Hydron Brown are dyed to best advantage in the ordinary jigger provided with squeezing rollers; light fabrics may also be dyed in a padding machine with a large trough, and light shades may be produced by padding.

Before dyeing, the pieces should be well cleaned by boiling or de-sizing, and if light shades are to be produced they should also be bleached.

Dyeing in the Jigger.

Charge the dyebath with the requisite dyestuff previously made to an even paste and with $1\frac{1}{2}$ —2 lbs caustic soda lye 77° Tw. per 10 gallons liquor and 2 to $2\frac{1}{2}$ times (for light shades with 3 to 4 times) the weight of Hydrosulphite conc. Powder as of dyestuff in powder form, varying with the depth of shade to be produced.

The temperature of the dyebath for Hydron Olive should be 50 — 60° C. (120 — 140° F.) and for Hydron Brown 40 — 50° C. (105 — 120° F.); for mixtures of the two it should be about 50° C. (120° F.).

When dyeing further lots in the standing bath, about one-half to two-thirds the quantities of dyestuff and hydrosulphite are required for deep shades as in the starting bath, and about two-thirds to three-quarters of these quantities for medium shades; for light shades the baths are exhausted, on which account the same quantities have to be added as for the starting bath, or a fresh bath may be started if preferred. The quantity of caustic soda lye may be reduced to 1 — $1\frac{3}{4}$ lbs per 10 gallons liquor for the standing baths, varying with the depth of shade.

In the case of goods difficult to penetrate, it is advisable to add $1\frac{1}{2}$ —3 oz monosolvol or the like per 10 gallons liquor. Dye in 6 to 10 passages, squeeze off, and rinse straightaway, finally best with hot water. Rather more reddish shades are obtained by soaping boiling hot.

Example for Dyeing a Full Olive Shade in the Jigger with Hydron Olive.

100 lbs Sateen	50—60 gallons liquor.	
	Starting Bath:	Additions for Subsequent Lots:
Hydron Olive G Powder	5 lbs	$3\frac{1}{2}$ lbs
Hydrosulphite conc. Powder	11 „	$7\frac{1}{2}$ „
Caustic soda lye 77° Tw.	0.9 gallon	0.6 gallon
Monosolvol or the like	0.1 „	0.05 „

The goods prepared for dyeing are given 6 to 10 passages at 50 — 60° C. (120 — 140° F.), then squeezed off, and rinsed cold to hot in a rinsing jigger placed alongside.

Both the dyebath and the goods should have an entirely green appearance; when the bath and the goods, i. e. the selvedges, begin to assume an olive colour, a little hydrosulphite and if necessary a little lye should further be added.

Example for Dyeing a Medium Brown Shade in the Jigger
with Hydron Brown.

100 lbs Twill	Starting Bath:	50—60 gallons liquor: Additions for Subsequent Lots:
Hydron Brown OB Powder	3 lbs	2 lbs
Hydrosulphite conc. Powder	7 „	4½ „
Caustic soda lye 77° Tw.	0.7 gallon	0.5 gallon
Monosolvol or the like	0.1 „	0.05 „

Prepare the goods well for the dyeing, give 6 to 10 passages (varying with the weight of the fabric) at 40—50° C. (105—120° F.), squeeze off evenly, run into a rinsing jigger placed alongside without beaming, and rinse from cold to hot. Then give if necessary two more boiling hot passages with about 4 oz soap and 1½—3 oz soda ash per 10 gallons liquor.

During the whole of the dyeing process the bath as well as the goods should have a dirty green appearance; when the bath and the selvages of the pieces commence to assume a brownish appearance, this is an indication that there is not enough of the reducing agent present, and a little hydrosulphite and if necessary a little lye should then be added.

Padding in the Padding Machine.

After freeing the goods well from size and drying them, pass them at 50—60° C. (120—140° F.) in the case of Hydron Olive, and at 40—50° C. (105—120° F.) in the case of Hydron Brown, through the customary small padding trough charged according to the desired shade,

for Hydron Olive with

3 oz — 1 lb	Hydron Olive G or B Powder	} per 10 gallons liquor.
12 oz — 2 lbs	Hydrosulphite conc. Powder	
2 lbs — 2¾ „	Caustic soda lye 77° Tw.	
1½ oz — 3 oz	Monosolvol, or the like	

and for Hydron Brown with

1½ oz — 8 oz	Hydron Brown OG or OB Powder	} per 10 gallons liquor.
6 „ — 1⅓ lbs	Hydrosulphite conc. Powder	
1 lb — 1⅝ lbs	Caustic soda lye 77° Tw.	
1½ oz — 3 oz	Monosolvol or the like	

The dye liquor is prepared in accordance with the shade desired in a vessel placed on a higher level, from which it flows continuously into the padding trough during the dyeing.

After dyeing, rinse first cold and then hot, and soap hot if necessary.

COMBINATIONS OF HYDRON OLIVE OR HYDRON BROWN
WITH HYDRON YELLOW.

It is best to reduce and dissolve each dyestuff separately with the respective quantities of hydrosulphite and caustic soda lye. The goods are then dyed for $\frac{1}{2}$ to $\frac{3}{4}$ hour at about 40° C. (105° F.), squeezed off, rinsed, and soaped, if necessary hot.

When using larger percentages of Hydron Yellow it is best to add common salt or desiccated Glauber's salt, as stated on pages 13 and 14, in order to better exhaust the bath.

COMBINATIONS OF HYDRON OLIVE OR HYDRON BROWN
WITH HYDRON BLUE.

Hydron Olive and Hydron Brown are reduced each separately with the respective quantities of hydrosulphite and caustic soda lye, and dissolved, being then added to the dyebath at about 50° C. (120° F.). The dissolving agents required for Hydron Blue are then added, and finally the Hydron Blue.

Dye for $\frac{1}{2}$ to 1 hour at 50—60° C. (120—140° F.), squeeze off, rinse, and soap if necessary.

COMBINATIONS OF HYDRON BLUE WITH HYDRON YELLOW.

Charge the dyebath of about 40° C. (105° F.) with Hydron Blue and the quantities of dissolving agents indicated on pages 6 and 7; then add the Hydron Yellow dissolved with the requisite quantities of hydrosulphite and lye (see page 13).

Dye for $\frac{1}{2}$ to 1 hour at abt. 40° C. (105° F.), squeeze off, and rinse; for deeper shades add some common salt or desiccated Glauber's salt in order to make the yellow go more readily on to the fibre.

For combinations with a larger proportion of Hydron Blue it is more advantageous to first dye in the customary manner with Hydron Blue and after rinsing to top with Hydron Yellow in a second, cold bath.

Dyeing of Mercerised Fabrics.

Work in the same manner and with the same additions as stated for ordinary piece-goods, reducing merely the quantities of dyestuff by about one-fourth, whereas the quantity of hydrosulphite should if anything be increased; at the same time add a little more Turkey-red oil or monosolvol to the dyebath.

Dyeing of Linen and Half-Linen Fabrics.

These are preferably dyed in an ordinary jigger provided with squeezing rollers as used for the dyeing of cotton with Hydron Blue, Hydron Dark Blue and Hydron Violet exclusively according to the sodium sulphide process, this method yielding excellent results in point of penetration particularly on hard and tightly woven linen fabrics; Hydron Yellow, Hydron Olive and Hydron Brown are dyed with hydrosulphite and caustic soda lye.

The directions for dyeing are the same as stated for cotton goods. It is recommended, however, to somewhat increase the quantities of Turkey-red oil or monosolvol, and when using Hydron Blue and Hydron Violet to boil the goods previous to the addition of hydrosulphite rather longer than is customary for cotton goods.

The quantities of dyestuffs mentioned in the card are those absorbed by the fibre in the standing bath. For medium and dark shades the starting baths should be charged with somewhat higher percentages, in accordance with our directions.

Without guarantee.

Hydron Blue G pat.



1% Hydron Blue G Paste 20% pat.



5

4.5% Hydron Blue G Paste 20% pat.



1.75% Hydron Blue G Paste 20% pat.



6

6% Hydron Blue G Paste 20% pat.



2.5% Hydron Blue G Paste 20% pat.



7

7.5% Hydron Blue G Paste 20% pat.



3.5% Hydron Blue G Paste 20% pat.



8

10% Hydron Blue G Paste 20% pat.

Hydron Blue B pat.

9



1% Hydron Blue B Paste 20% pat.

13



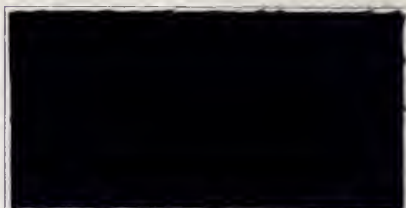
4.5% Hydron Blue B Paste 20% pat.

10



1.75% Hydron Blue B Paste 20% pat.

14



6% Hydron Blue B Paste 20% pat.

11



2.5% Hydron Blue B Paste 20% pat.

15



7.5% Hydron Blue B Paste 20% pat.

12



3.5% Hydron Blue B Paste 20% pat.

16



10% Hydron Blue B Paste 20% pat.

Hydron Blue R pat.

17



2.25% Hydron Blue R Paste 20% pat.

21



10% Hydron Blue R Paste 20% pat.

18



3.75% Hydron Blue R Paste 20% pat.

22



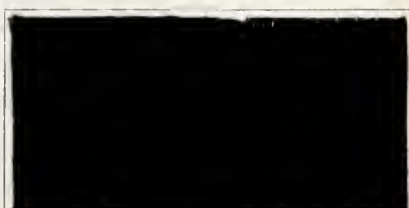
12% Hydron Blue R Paste 20% pat.

19



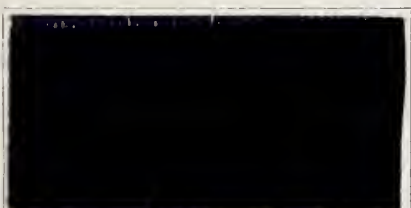
5.5% Hydron Blue R Paste 20% pat.

23



14% Hydron Blue R Paste 20% pat.

20



8% Hydron Blue R Paste 20% pat.

24



16% Hydron Blue R Paste 20% pat.

Hydron Blue aftertreated with Perborate

25



1% Hydron Blue G Paste 20% pat.
aftertreated with perborate.

29



5% Hydron Blue B Paste 20% pat.
aftertreated with perborate.

26



1.75% Hydron Blue G Paste 20% pat.
aftertreated with perborate.

30



7.5% Hydron Blue B Paste 20% pat.
aftertreated with perborate.

27



2.5% Hydron Blue G Paste 20% pat.
aftertreated with perborate.

31



5.5% Hydron Blue R Paste 20% pat.
aftertreated with perborate.

28



3.5% Hydron Blue G Paste 20% pat.
aftertreated with perborate.

32



8% Hydron Blue R Paste 20% pat.
aftertreated with perborate.

Hydron Dark Blue G pat.

Hydron Violet B pat.

33



4.5% Hydron Dark Blue G Paste
20% pat.

37



3.75% Hydron Violet B Paste 20% pat.

34



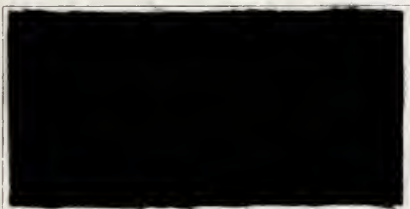
7.5% Hydron Dark Blue G Paste
20% pat.

38



6% Hydron Violet B Paste 20% pat.

35



12% Hydron Dark Blue G Paste
20% pat.

39



9% Hydron Violet B Paste 20% pat.

36



16% Hydron Dark Blue G Paste
20% pat.

40



12% Hydron Violet B Paste 20% pat.

Hydron Violet R pat.

Hydron Yellow G pat.

41



3.75% Hydron Violet R Paste 20% pat.

45



4.5% Hydron Yellow G Paste 20% pat.

42



6% Hydron Violet R Paste 20% pat.

46



7.5% Hydron Yellow G Paste 20% pat.

43



9% Hydron Violet R Paste 20% pat.

47



10% Hydron Yellow G Paste 20% pat.

44



12% Hydron Violet R Paste 20% pat.

48



12% Hydron Yellow G Paste 20% pat.

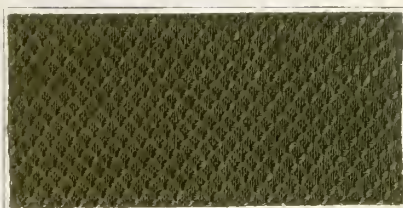
Hydron Olive G and B pat.

49



0.6% Hydron Olive G Powder pat.

53



0.6% Hydron Olive B Powder pat.

50



1% Hydron Olive G Powder pat.

54



1% Hydron Olive B Powder pat.

51



1.5% Hydron Olive G Powder pat.

55



1.5% Hydron Olive B Powder pat.

52



2% Hydron Olive G Powder pat.

56



2% Hydron Olive B Powder pat.

Hydron Brown OG and OB pat.

57



0.6% Hydron Brown OG Powder pat.

61



0.6% Hydron Brown OB Powder pat.

58



1% Hydron Brown OG Powder pat.

62



1% Hydron Brown OB Powder pat.

59



1.5% Hydron Brown OG Powder pat.

63



1.5% Hydron Brown OB Powder pat.

60



2% Hydron Brown OG Powder pat.

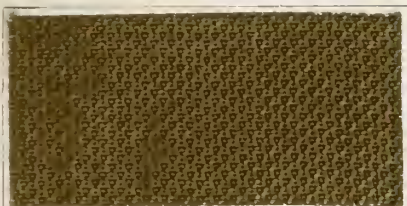
64



2% Hydron Brown OB Powder pat.

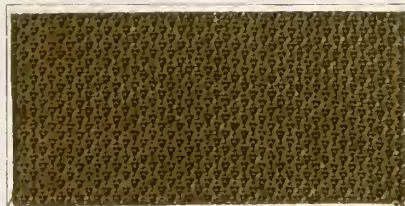
COMPOUND SHADES PRODUCED WITH HYDRON COLOURS

65



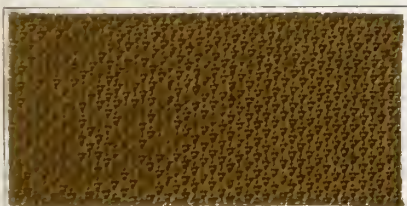
0.4% Hydron Brown OB Powder pat.
0.3% Hydron Yellow G Paste 20% pat.

69



0.45% Hydron Brown OB Powder pat.
0.35% Hydron Yellow G Paste 20% pat.

66



0.3% Hydron Brown OB Powder pat.
0.1% Hydron Brown OG Powder pat.
0.5% Hydron Yellow G Paste 20% pat.

70



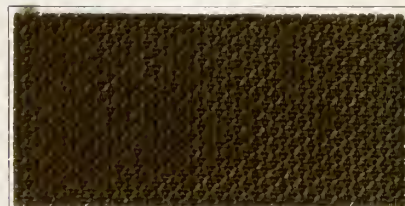
0.6 % Hydron Brown OB Powder pat.
0.46% Hydron Yellow G Paste 20% pat.

67



0.5 % Hydron Brown OB Powder pat.
0.25% Hydron Brown OG Powder pat.
0.4 % Hydron Yellow G Paste 20% pat.

71



0.8% Hydron Brown OB Powder pat.
0.8% Hydron Yellow G Paste 20% pat.

68



0.75% Hydron Brown OB Powder pat.
0.25% Hydron Brown OG Powder pat.
0.6 % Hydron Yellow G Paste 20% pat.

72

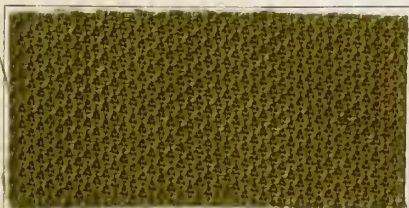


1.5% Hydron Brown OB Powder pat.
2 % Hydron Yellow G Paste 20% pat.

CASSELLA COLOR COMPANY, NEW YORK.

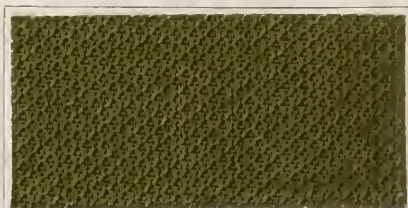
COMPOUND SHADES PRODUCED WITH HYDRON COLOURS

73



0.4 % Hydron Brown OG Powder pat.
1.25% Hydron Yellow G Paste 20% pat.

77



0.4% Hydron Olive G Powder pat.
0.1% Hydron Brown OG Powder pat.

74



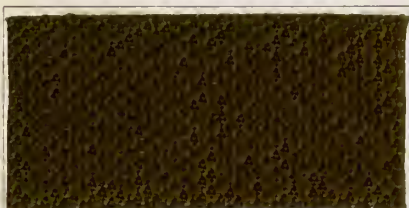
0.5% Hydron Brown OG Powder pat.
2 % Hydron Yellow G Paste 20% pat.

78



0.75% Hydron Olive G Powder pat.
0.15% Hydron Brown OG Powder pat.

75



3 % Hydron Yellow G Paste 20% pat.
0.75% Hydron Brown OB Powder pat.

79



1.25% Hydron Olive G Powder pat.
0.25% Hydron Brown OG Powder pat.

76



3.5% Hydron Yellow G Paste 20% pat.
1.2% Hydron Brown OB Powder pat.

80



2 % Hydron Olive G Powder pat.
0.35% Hydron Brown OG Powder pat.

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COMPOUND SHADES PRODUCED WITH HYDRON COLOURS

81



0.2% Hydron Brown OG Powder pat.
1.2% Hydron Olive B Powder pat.

85



0.6% Hydron Yellow G Paste 20% pat.
1.6% Hydron Brown OG Powder pat.

82



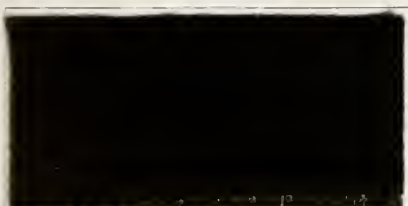
0.1% Hydron Brown OG Powder pat.
1.5% Hydron Olive B Powder pat.

86



1.2% Hydron Yellow G Paste 20% pat.
2 % Hydron Brown OG Powder pat.

83



0.48% Hydron Brown OG Powder pat.
2.25% Hydron Olive B Powder pat.

87



2.5% Hydron Brown OG Powder pat.
1.5% Hydron Yellow G Paste 20% pat.

84



0.8% Hydron Brown OG Powder pat.
3 % Hydron Olive B Powder pat.

88



3% Hydron Brown OG Powder pat.
2% Hydron Yellow G Paste 20% pat.

CASSELLA COLOR COMPANY, NEW YORK.

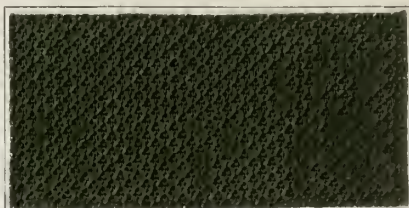
COMPOUND SHADES PRODUCED WITH HYDRON COLOURS

89



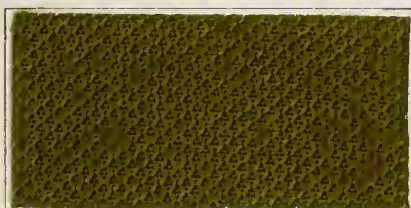
9 % Hydron Yellow G Paste 20% pat.
0.2% Hydron Olive B Powder pat.

93



0.4 % Hydron Olive B Powder pat.
0.25% Hydron Blue G Paste 20% pat.

90



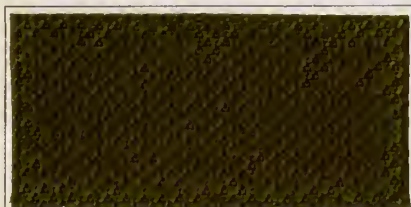
10 % Hydron Yellow G Paste 20% pat.
0.4% Hydron Olive B Powder pat.

94



0.65% Hydron Olive B Powder pat.
0.35% Hydron Blue G Paste 20% pat.

91



11% Hydron Yellow G Paste 20% pat.
1% Hydron Olive B Powder pat.

95



1.5% Hydron Olive G Powder pat.
0.3% Hydron Blue G Paste 20% pat.

92



12 % Hydron Yellow G Paste 20% pat.
1.6% Hydron Olive B Powder pat.

96



2.5% Hydron Olive G Powder pat.
0.4% Hydron Blue G Paste 20% pat.

CASSELLA COLOR COMPANY, NEW YORK.

COMPOUND SHADES PRODUCED WITH HYDRON COLOURS

97



1.6 % Hydron Blue G Paste 20% pat.
0.12% Hydron Brown OG Powder pat.

101



7.5% Hydron Yellow G Paste 20% pat.
10 % Hydron Blue G Paste 20% pat.
0.8% Hydron Brown OG Powder pat.

98



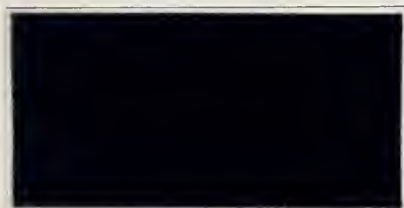
0.16% Hydron Brown OG Powder pat.
2.5 % Hydron Blue G Paste 20% pat.

102



0.8% Hydron Olive B Powder pat.
4.5% Hydron Blue G Paste 20% pat.
0.9% Hydron Brown OG Powder pat.

99



3 % Hydron Blue G Paste 20% pat.
0.25% Hydron Brown OG Powder pat.

103



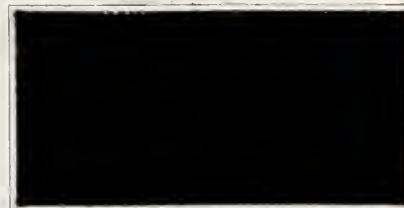
2.25% Hydron Olive G Powder pat.
1.5 % Hydron Blue G Paste 20% pat.
0.3 % Hydron Brown OG Powder pat.

100



6 % Hydron Yellow G Paste 20% pat.
8 % Hydron Blue G Paste 20% pat.
0.6% Hydron Brown OG Powder pat.

104



1.25% Hydron Brown OG Powder pat.
1 % Hydron Olive B Powder pat.
4 % Hydron Blue G Paste 20% pat.

CASSELLA COLOR COMPANY, NEW YORK.

HYDRON BLUE ON COTTON PIECE-GOODS
FROM PRACTICE

105



7.5% Hydron Blue B Paste 20% pat.

106

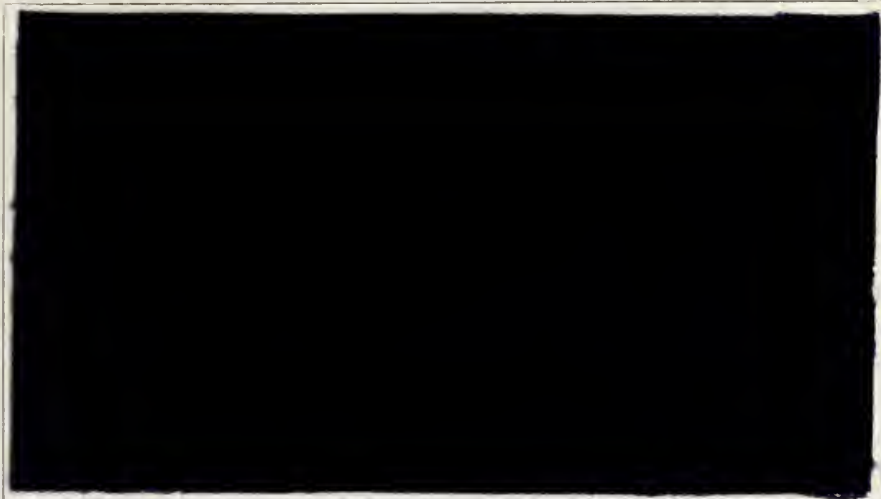


7% Hydron Blue R Paste 20% pat.
4% Hydron Blue G Paste 20% pat.

CASSELLA COLOR COMPANY, NEW YORK.

HYDRON BLUE ON HALF-LINEN PIECE-GOODS
FROM PRACTICE

107



4.5% Hydron Blue R Paste 20% pat.
3.5% Hydron Blue G Paste 20% pat.

108

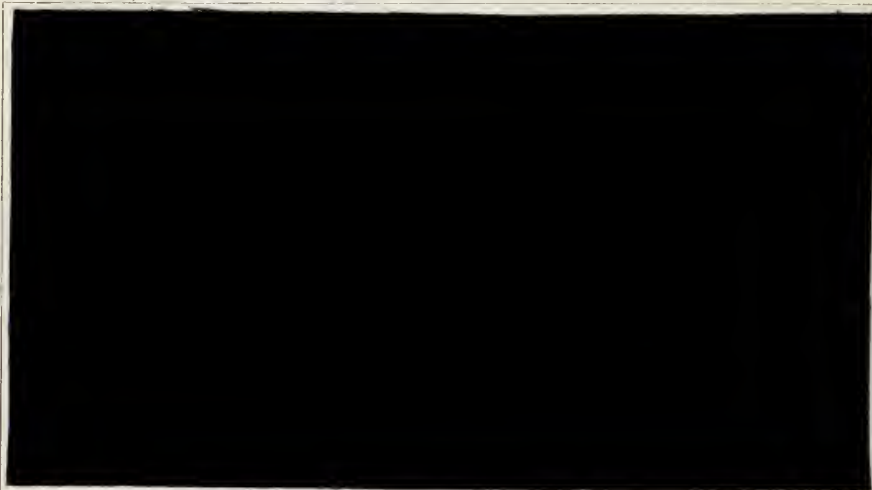


11% Hydron Blue B Paste 20% pat.

CASSELLA COLOR COMPANY, NEW YORK.

HYDRON BLUE ON LINEN PIECE-GOOOS
FROM PRACTICE

109



8% Hydron Blue R Paste 20% pat.
3% Hydron Blue G Paste 20% pat.

110



14% Hydron Blue R Paste 20% pat.
4% Hydron Blue G Paste 20% pat.

CASSELLA COLOR COMPANY, NEW YORK.

SPECIAL 87 E
12.001

